

looked all specimens of *E. timandra* in my collection carefully through, and had the great satisfaction to find a few specimens of *E. varicosa* Pf. The two species differ in the characters mentioned by Edg. A. Smith; however, I have one specimen of *E. varicosa* with two lamellae in the body-whorl. If not very carefully examined, the two species may very easily be confounded. It seems that *E. timandra* occurs only on the North Island, while *E. varicosa* seems to be limited to South Island.

6. *Charopa sylvia* Hutton. I thought this species to be identical with *Ch. tau* Pfeiffer (Ref. List., l. c., p. 657), but felt always more or less doubtful. I therefore sent specimens with the others to Mr. Edg. A. Smith, and he very kindly wrote to me: "*Ch. sylvia* Hutt. You question this being the same as *Hel. tau* Pfr. We have not yet the latter in the Museum, but Pfeiffer's description of the sculpture '*subdistantum costato-plicata*' scarcely applies to your specimens. They are undoubtedly identical with Pfeiffer's *Hel. gamma*. I have compared them with the types, and they agree in every respect, excepting that yours are fresher." Therefore:

Charopa buccinella Reeve, sp., 1852 (= *gamma* Pfeiffer, 1852 (? 1853)) = *sylvia* Hutton, 1883).

Now it remains to identify *Ch. tau* Pfr. It may be that my *Charopa mutabilis* is this species; I have sent a specimen to Vienna to have it compared with Pfeiffer's type, and am awaiting a report.

New Zealand, Christchurch, Sept. 6, 1893.

SHELLS OF THE SAGINAW VALLEY, MICHIGAN.

BY BRYANT WALKER, DETROIT, MICHIGAN.

Some twenty-five years ago the late Dr. George A. Lathrop, while residing at East Saginaw in this State, made a considerable collection of the shells, which he found in that vicinity.

After lying packed away for many years, the collection has recently come into my possession, and as it contains some material of considerable interest, and no local catalogue from that part of the State has ever been published, the following list of the species represented has been deemed worthy of a permanent record.

I am indebted to Dr. V. Sterki for the determination of the Pupidae and to Mr. A. A. Hinkley for the identification of *Goniobasis*

semicarinata Say and *depygis* Say. Unless otherwise specified the locality is in all cases East Saginaw.

Selenites concavus Say.

Zonites nitidus Mull.

Zonites indentatus Say.

Zonites arboreus Say.

Zonites minusculus Binn.

Zonites radiatulus Alder.

Zonites fulvus Dr.

Zonites multidentatus Say. Heretofore cited only from the western part of the State.

Patula alternata Say.

Patula perspectiva Say.

Patula striatella Anth.

Patula lineata Say.

Punctum pygmæum minutissimum Lea.

Helix multilineata Say.

Helix thyroides Say.

Helix albolabris Say. Above the average in size and one example an almost perfect albino.

Helix albolabris dentata.

Helix exoleta Binn.

Helix sayii Binu. Port Austin. A new locality for this (in Michigan) rare species.

Helix mondon fraterna Say.

Helix leaii Ward.

Helix tridentata Say.

Helix palliata Say.

Helix virgata Da Costa. A single well marked example of this species, apparently of the variety called "*alba*" by Taylor, occurs in the collection with the following label: "From Dr. Clark of Flint, Michigan, where he says it was found." Dr. Clark was a well known physician of Flint in times past; but as both he and Dr. Lathrop are dead, it is not probable that any further information in regard to the circumstances under which this shell was found can be had. The specimen though mature, is not quite fresh, and as the body whorl was filled with hard packed fine sand it seems very probable that it was imported in the earth about some foreign plants.

Vallonia pulchella Mull. Determined by Dr Sterki.

Strobilops labyrinthica Say.

Pupa corticaria Say. These are the first specimens seen from the eastern part of the State.

Pupa armifera Say.

Pupa contracta Say.

Vertigo ovata Say.

Vertigo gouldii Binn. Quite abundant apparently, and exhibiting some considerable variation in size. A single albino example is included, of which Dr. Sterki writes "This is a very interesting and valuable specimen; the only true albino among many thousand specimens of our *Vertigos* I have seen."

Vertigo ventricosa elatior Sterki. Not heretofore known from Michigan.

Vertigo pentodon Say.

Vertigo curvidens Gld.

Ferussacia subcylindrica L.

Succinea oblivua Say.

Succinea peoriensis Wolf.

Succinea avara Say.

Succinea sp.

Succinea ovalis Gld.

Succinea sp.

There are four forms of *Succinea* in the collection, which group around *S. ovalis* Gld. as a type. The first is the form usually called *ovalis* characterized by the short; rather blunt spire, elongated body whorl and effuse aperture. The second is the *peoriensis* of Wolf, a very widely extended form in Michigan and easily separated from the "*ovalis*" by reason of the shorter body whorl and more nearly oval aperture, which though somewhat narrowed posteriorly lacks the patulous expansion anteriorly so characteristic of the former. The third resembles *ovalis* in the shape of the aperture, but is a more slender shell and has the spire more elongated than either the preceding forms. It appears to range generally over the State and is the same form noticed as "*S. higginsi* Bld." in my catalogue of Michigan shells (NAUT. VI, p. 19).

The fourth form is quite remarkable. Having the general shape, characteristic of the group, it far exceeds them all in dimensions, equalling in length a good sized *S. obliqua* Say. These shells were labeled by Dr. Lathrop as "*S. sillimani* Bld.?" They agree substantially in form and size with figures of that species given by Binney. Some individuals, however, have the spire more produced, resembling in that respect the figures of *S. hawkinsi* Bd.; but the suture is not impressed to the extent represented in that species. None of them have the blunt apex, which seems to be characteristic of *S. haydeni* W. G. Binn., though fully equalling that species in size. Cockerell (NAUT. VI, pp. 23 and 29) refers all these forms to the *S. elegans* Risso of Europe. It is possible that these specimens

are similar to the Canadian examples, which he refers to that species.

Carychium exiguum Say.

Limnæa stagnalis L.

Limnæa catascopium Say.

Two forms of this species are represented in the collection. One from the Saginaw River is of the usual form, but of unusual size, one example being nearly one and one-fourth inches in length.

The other form from Saginaw Bay is characterized by its greatly inflated body whorl and very short, rapidly acuminate spire. A single specimen from Lake Huron represents the form usually found in the Great Lakes.

Limnæa reflexa Say. Bayou, East Saginaw and Saginaw Bay. The latter somewhat smaller and more slender than the former.

Limnæa reflexa scalaris. Intermediate between the type and the variety.

Limnæa palustris Mull. Larger than the average in size. The striped variety corresponding to form of *L. reflexa* known as *zebra* Tryon, is also represented.

Limnæa cubensis Pfr.

Physa ancillaria Say. Saginaw Bay.

Physa sayii Tapp.

Physa gyrina hildrethiana Lea.

Aplexa hypnorum L.

Planorbis trivolvis Say.

Planorbis bicarinatus Say.

Planorbis campanulatus Say.

Planorbis albus Mull.

Planorbis exacutus Say.

Planorbis parvus Say. Among a number of the usual form of this species occurs one of the curiously distorted examples, in which the whorls almost from the apex are entirely detached from each other and coiled obliquely like a ram's horn.

Segmentina armigera Say.

Ancylus fuscus Ad. Saginaw River.

Ancylus parallelus Hald. Saginaw River. Much narrower and with the sides more flattened and hence more nearly parallel than in specimens from other localities.

Lyogyrus pupoidea Gld. Heretofore this species has been cited only from the western part of the State.

Campeloma decisa Say. Cass River.

Amnicola porata Say.

Bythinella obtusa Lea.

Goniobasis livescens Mke. Saginaw Bay.

Goniobasis semicarinata Say. Saginaw River.

This is the first time this species has been cited from this State.

Goniobasis depygis Say. Saginaw River.

This species, although cited in the earlier lists of Sager and Miles, has not been found by any of the more recent collectors.

Goniobasis milesii Lea. Cass River.

Two specimens "from Dr. Miles," which seem to justify Tryon's doubt as to whether the species is more than a globose form of *G. livescens* Mke.

Unio alatus Say. Saginaw River.

Unio asperimus Lea. Saginaw River. This is the first recorded occurrence of this species in the eastern part of the State. It may be of interest to add that Dr. W. H. DeCamp of Grand Rapids informs us that the species has also been recently found in the Grand River, so that the doubt formerly cast upon its occurrence in Michigan must be considered as entirely removed.

Unio cornutus Bar. Another addition to the fauna of the eastern part of the State. One example, probably a female, is unusually elongated.

Unio ellipsis Lea. This and all the following species are from Saginaw River.

Unio gibbosus Bar.

gracilis Bar.

ligamentinus Lam.

luteolus Lam.

nasutus Say.

novi-eboraci Lea.

phaseolus Hild.

rectus Lam.

rubiginosus Lea.

schoolcraftii Lea.

ventricosus Bar.

Margaritina deltoidea Lea.

Anodonta benedictii Lea.

footiana Lea.

imbecilis Say.

Sphærium striatinum Lam.

rhomboideum Say.

occidentale Pme.

partumeium Say.

truncatum Lam.

Pisidium virginicum Lam.

abditum Hald.

compressum Pme.

variabile Pme.